

THE LAND MOLLUSCAN FAUNA OF BRITISH NEW
GUINEA.

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(Plates xxiv.-xxvi.)

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Museum.*)

Since the publication of former parts of this paper, several small collections, made on various official tours, have been kindly sent to the Australian Museum by His Honour Sir William Macgregor, Administrator of British New Guinea. Instructed by the Trustees of that Institution, I have studied the new or little-known species therein contained.

Ground entirely new to science was broken by the exploration of the Purari Valley.* The mollusca found there embraced:—*Papuina canovarii*, Canefri; *P. braziera*, Brazier var.; *lixoni* Brazier; *P. tayloriana*, Adams and Reeve; *Chloritis dino-deomorpha*, Canefri; *Planispira macgregori*, Hedley; *P. dominula*, Canefri; *P. plagiocheila*, Canefri; *P. rhodomphala*, Canefri; *Nanina citrina*, Linné; *N. cairni*, Smith; *Sitala maino*, Brazier; *S. starkei*, Brazier; *Helicarion musgravei*, Hedley; H. sp.; *Leptopoma gianelli*, Canefri; *Cyclotus levis*, Pfeiffer; *Helicina leucostoma*, Canefri; *H. multicornata*, Hedley; H. sp.; *Realia isseliana*, Canefri; *Melania singularis*, Canefri; *Neritina porcata*, Gould; besides the following two novelties:—

* The Purari or Wickham, or Queen's Jubilee River enters the Papuan Gulf at 7° 50' S. Lat., 145° 10' E. Long.

OTOPOMA MACGREGORÆ, n.sp.

(Pls. xxiv. and xxv., figs. 5, 7, 20.)

Shell globosely conical, openly umbilicate, thin, translucent. Colour pale straw with a brown band which, peripheral on the last whorl, becomes sutural above; beneath this band are a few narrow indistinct brown lines, and the space above it is obscurely mottled with brown. This pattern is visible from within. Whorls 5, rounded and rapidly enlarging. Spire small, well exerted. Suture impressed. Epidermis thick, like felt to the touch, under the lens closely beset with tiny bristles, arranged quincunx. Umbilicus broad, deep and spiral. Aperture oblique, subcircular, angled posteriorly. Peristome sharp, straight, at the left anterior side broadly expanded into a sub-triangular lobe. Operculum (fig. 7) ovate, paucispiral, within flat and corneous, outside concave and calcareous, with a deep sulcus at the suture. Height of shell 13, maj. diam. 12, minor diam. 9 mm.

Type in the Australian Museum.

Judging from figures and description, this remarkable shell, of a genus not hitherto recorded from Papua, nearest approaches *O naticoides*, Recluz; it is dedicated to the writer's accomplished friend, Lady Macgregor. On pl. xxv. fig. 20, I have sketched the radula. But a solitary example of this species was obtained.

SITALA ANTHROPOPHAGORUM, n.sp.

(Pls. xxiv., xxv., and xxvi., figs. 1, 3, 21, 24.)

Shell conoid, rounded on the base and angled at the periphery, very thin, smooth, shining, translucent, subperforate. Coloured as if made of gelatine. Whorls $5\frac{1}{2}$, moderately rounded. Sculpture: above and below faint, irregular, oblique, growth lines mark the surface; on the base in addition close, regular, waved, concentric striæ are visible with a microscope; a raised thread-like keel winds round the periphery and ascends the spire immediately above the suture. Aperture a little oblique, subrhomboidal, neither descending nor ascending, neither thickened nor reflected,

except the columella, which is closely and shortly curled over a shallow, narrow, spiral, perforation. Height $5\frac{1}{2}$, major diam. $6\frac{1}{4}$, minor diam. $5\frac{1}{2}$ mm.

Type in the Australian Museum. Foot narrow, with pedal line and oblique grooves, tail with mucous pore. The absence or existence of a surmounting horn could not be ascertained from spirit specimens. Genitalia (Pl. xxvi., fig. 24) like that of *S. attegia*, Benson, in possessing a dart sac. The extreme smallness of the teeth of the radula (Pl. xxv., fig. 21) defied exact computation. I estimated their number at 160 rows of 140 : 6 : 1 : 6 : 140. The rachidian is long and slender, the median cusp overlapping the basal plate, two minute pairs of auxiliary cusps are located at one and two-thirds respectively of its length. The laterals are sinuate with a small proximal accessory cusp and two or three distal ones. The marginals are almost the shape of a reversed S, the distal blade beset with numerous small cusps.

This undescribed species has for many years been represented in the Museum by specimens obtained by Mr. W. W. Froggatt, of the Fly River Expedition of 1885.

My examination of this species induces me to suppose that the genus *Trochonanina* of Mousson should be reduced to a synonym of *Sitala*.

LAGOCHEILUS POIRIERII, Tapparone Canefri.

This species was described doubtfully as a *Cyclotus*, from a solitary example found by D'Albertis. A much larger and better preserved specimen has been sent from the Purari Valley by Sir William Macgregor. Its measurements are: height 11, maj. diam. 10, minor diam. 9 mm. The keel and elevated lines described by Tapparone Canefri are in this instance (Pl. xxiv, fig. 2) clad with short stiff epidermal bristles. The operculum (Pl. xxiv, fig. 4) is corneous, circular, multispiral, with subcentral nucleus. The species will therefore be more appropriately bestowed in *Lagocheilus*.

PARTULA MACLEAYI, Brazier.

A shell containing the animal, collected by Mr. English, was sent from Rigo. I failed to make a satisfactory dissection of the genitalia. The jaw (Pl. xxvi, fig. 23) is thin, flexible and pale yellow, arched, crossed perpendicularly by very numerous and slender riblets which slightly denticulate the inferior margin. The slightly imperfect radula (Pl. xxvi., fig. 22) that I examined contained 160 rows of 40 : 6 : 1 : 6 : 40. The rachidian is advanced half a length before the immediate laterals; it is small, with a single ovate cusp whose tip projects over the basal plate, the latter being a little expanded posteriorly. The laterals are set aslant to the rachidian, and are armed with a large ovate proximal cusp and a small thorn-shaped distal one, the basal plate being bent posteriorly towards the rachidian. In the marginals the small cusp divides first into two then into three, receding they become larger and more sloped.

Seeing that a plaited jaw may be welded into a ribbed one, I am not disposed to consider the eccentric jaw of *macleayi* as outweighing in taxonomic value those characters of the shell and radula which point to *Partula*. Other figures of *Partula* dentition are: Malak. Blatt., 1867, xiv., Pl. i., fig. 1; Annals New York Acad., iii., Pl. xi., fig. L, Pl. xv., fig. o; Reis. Philip., iii., Pl. xvii., fig. 18.

PAPUINA ZENO, Brazier.

Specimens of this species accompanied the last. Its genital system (Pl. xxvi., fig. 27) was seen to be like that of *P. brumeriensis*, remarkable for its simplicity. The epiphallus, on which is the retractor muscle, passes insensibly into the wide vas deferens. My illustration shows the penis-papilla in section.

The jaw (Pl. xxv., fig. 15) is thin, wide, and crossed by weak ribs.

For formula the radula has 153 rows of 42 : 10 : 1 : 10 : 42. (Pl. xxv., fig. 14). The rachidian cusp is narrower than that of the laterals; both are square-headed and surpass the basal

plates. On the laterals develop a minor proximal cusp, and the larger cusp becomes rounded.

On specimens from Rossel Island, Louisiades, were made the following notes.

PAPUINA CHAPMANI, Cox.

Genital system provided with a flagellum two-thirds the length of the epiphallus; penis sac stout; right tentacle retracted between male and female branches (Pl. xxvi., fig. 29).

The jaw (Pl. xxv., fig. 11) is arched, ends rounded, crossed by weak ribs.

Radula (Pl. xxv., fig. 12), formula 138 rows of 32 : 6 : 1 : 6 : 32, of the same pattern as the preceding.

PAPUINA GURGUSTI, Cox.

Genital system : epiphallus long with rudimentary flagellum ; papilla long and tapering (Pl. xxvi., fig. 26).

Jaw (Pl. xxv., fig. 19) like the foregoing. Radula (Pl. xxv., fig. 18), formula 145 rows of 47 : 10 : 1 : 10 : 47, of similar character to the last.

TROCHOMORPHA NIGRANS, Smith.

Genital system : penis sac surmounted by a globose bilobed pouch, half its size, from the base of which arises the epiphallus. The boot-shaped spermatheca is seated upon a short duct. The above note was made before I saw the account of *T. planorbis* in Pilsbry's review of *Trochomorpha* [Man. Conch. (2) ix.], and I am not now able to say whether the external resemblance of *P. nigrans* to it is completed by the possession of internal vaginal glands.

Radula (Pl. xxvi., fig. 28) small, narrow, formula 118 rows of 26 : 23 : 1 : 23 : 26. Rachidian slender, with a single lanciform cusp which projects beyond the basal plate. Laterals slightly larger and inclined. Marginals sinuate, bicapitate.

An exploring expedition which ascended Mount Maneao (the Mount Dayman of earlier maps) brought back an interesting collection of mollusca, comprising *Neritina cornea*, *Nanina cairni*, *Rhysota flyensis*, *Chloritis rehsei*, *Papuina tayloriana*, var *strabo*, *P. t.* var *katauensis*, and the following novelty:—

PAPUINA SECANS, n.sp.

(Pl. xxv., figs. 8, 9.)

Shell imperforate, trochiform, solid; spire conic; apex mammilar, obtuse. Whorls 5, separated by an impressed suture, inflated on their inner side, but on the outer compressed at the very sharp keel, which runs around the whorls and disappears just behind the aperture. Sculpture coarse, oblique growth lines decussated and somewhat microscopically beaded by minute, close, waved, spiral, impressed lines. Colour above pale purple, which fades into white on reaching the keel of the last whorl; the latter is above the periphery painted by seven chestnut spiral bands, opaque when seen by transmitted light; behind the aperture these bands broaden and merge together into a dark transverse stain; thinning out they fade away after ascending the shell for about half a whorl. The base is encircled by five similar bands. Aperture diagonal, abruptly and deeply descending. Lip intense black, broadly reflected, beaked at the periphery, above the beak dented without and tuberculate within. Columella very broad, adherent to the base, toothed on the inner edge. Margins united by a narrow brown ridge of callus. Fragments of a coarse (?) yellowish, hydrophanous epidermis appear on the last whorl.

Maj. diam. 40, min. 33, alt. 22 mm.

One example containing the animal was found, March, 1894, at a height of from 1000 to 6000 ft. on Mount Maneao, B.N.G., by the collectors of Sir William Macgregor.

Type in the Australian Museum.

Larger than any related form this species resembles *tayloriana* in form and *zeno* in coloration; other allies are *naso* and *diomedes*.

Mr. E. A. Smith has suggested ("Conchologist," March, 1893, iii. p. 108) that the shells I styled *Oxytes* would have been more suitably grouped under *Rhysota*. Specimens of *R. flyensis*, containing the animal, received from Mount Maneao prove that this opinion is perfectly correct. These spirit examples showed the foot to be provided with a large tail pore, pedal line and oblique grooves. Radula (Pl. xxv., fig. 17) narrowly ovate, 10 by 5 mm., formula 120 rows of 90 : 20 : 1 : 20 : 90 ; rows nearly straight, meeting at a low angle in the centre and sweeping gently backwards at the margin ; rachidian cusp stout, an isosceles triangle, with rudimentary cusps at its base, basal plate rather hour-glass-shaped ; immediate laterals rather larger than and inclined towards the rachidian, unicuspidate ; the very numerous marginals with a long knife-like blade grow smaller as they retreat. Of the genitalia (Pl. xxiv., fig. 6) the penis sac is large and thick, epiphallus long and narrow, folded upon itself at half its length, where is attached the adductor muscle, which arises from the hind end of the floor of the pulmonary sac near the heart ; a small caecum exists at the entrance of the vas deferens ; the spermatheca is much enlarged at its base, then contracted, and again expanded. Jaw (Pl. xxv. fig. 16) smooth, arched, with a median keel projecting on the inferior margin.

Of *CHLORITIS REHSEI*, the only available animal parted in the middle while being withdrawn from the shell, and on unravelling the genitalia (Pl. xxvi., fig. 25) those parts lying beyond the first whorl were found wanting. The penis sac is long and tapers to the orifice above the attachment of the retractor muscle, the epiphallus gradually enlarges, and a finger-shaped flagellum arises at the termination of the vas deferens ; on splitting the penis sac no papilla was found contained ; the interior walls are obliquely wrinkled. Jaw (Pl. xxv., fig. 13) arched, crossed by numerous stout ribs. Radula (Pl. xxv., fig. 12) has for formula 224 rows of 46 : 20 : 1 : 20 : 46. It is constructed like others of its allies that I have previously described.

In several instances, chiefly from want of illustration, several Papuan species have received second names. The type of *P.*

sicula, Brazier, now in the Macleay Museum, but which I had, when writing the former article, been unable to study, I have since opposed to Tapparone Canefri's figure of *P. meditata*, with which it exactly corresponds. There can be no doubt that as *Nanina orbiculum*, Tapparone re-described Brazier's *Thalassia annula*, and I am sure that *Nanina bruijui* may similarly be referred to *Microcystina sappho*. From an inspection of authentic specimens (part of the original lot) kindly sent me by Mr. Pilsbry, I should consider that his species *Helicina dentoni* is equivalent to *H. solitaria*, Smith. When writing the preceding part, I examined the series collected by Mr. Bevan on the Douglas River, from which was selected the type of *P. agnocheilus*, Smith; after contrasting this with a series of *P. tomasinelliana*, Tapparone Canefri, from its type locality, the Fly River, I referred it to that species.

An examination of the actual type of *Helix hixonii*, Brazier, preserved in the collection of Mr. Hobson, enables me to rectify mistakes which have arisen regarding it. I recognise in "*Helix hixonii*," the common or large form of *Papaina brazierae*, occurring abundantly throughout the St. Joseph River district, the veritable *brazierae* being a dwarf race confined to Yule Island. The classification of *Helix hixonii* as a *Hadra*, originated by Tapparone Canefri, was followed by Pilsbry and myself, who were unacquainted with the shell. A reference to the "Fauna Malacologica della Nuova Guinea" shows that Tapparone also never saw it. His figure, presumably from an unpublished sketch forwarded by Mr. Brazier, shows the shell so tilted as to hide the contour of the spire, and it is besides inaccurately drawn.

It may not be out of place to mention here that specimens in the Australian Museum, collected by Mr. Brazier at Wanga, San Christoval, Solomons, answer precisely to Papuan examples of *Helicina louisiadensis*, Forbes. This considerably extends the known range of that species.

EXPLANATION OF PLATES.

PLATE XXIV.

- Figs. 1 and 3.—Peripheral and basal aspects of the shell of *Sitala anthropophagorum*, Hedley ; (type) much enlarged.
 Fig. 2.—Sketch of sculpture of *Cyclotus poirieri*, Canefri.
 Fig. 4.—Imperfect operculum of the same ; much enlarged.
 Fig. 6.—*Otopoma macgregoriae*, Hedley ; (type) much enlarged.
 Fig. 7.—Exterior aspect of operculum of the same ; much enlarged.
 Fig. 6.—Genitalia of *Rhysota flyensis*, Hedley.
 Figs. 8 and 9.—Basal and peripheral aspects of type shell of *Papuniasecaus*, Hedley ; natural size.

PLATE XXV.

- Fig. 10.—Central and marginal teeth from the radula of *P. chapmani*, Cox.
 Fig. 11.—Jaw of the same.
 Fig. 12.—Central and marginal teeth from the radula of *C. rehsei*, Martens.
 Fig. 13.—Jaw of the same.
 Fig. 14.—Central and marginal teeth from the radula of *P. zeno*, Brazier.
 Fig. 15.—Jaw of same.
 Fig. 16.—Jaw of *R. flyensis*, Hedley.
 Fig. 17.—Central and marginal teeth from the radula of the same.
 Fig. 18.—Central and marginal teeth from the radula of *P. Gurgusti*, Cox.
 Fig. 19.—Jaw of the same.
 Fig. 20.—Teeth from the radula of *O. macgregoriae*, Hedley.
 Fig. 21.—Central and lateral teeth from the radula of *S. anthropophagorum*, Hedley.

Figs 10 to 21 variously magnified.

PLATE XXVI.

- Fig. 22.—Central and lateral teeth from the radula of *B. macleayi*, Brazier.
 Fig. 23.—Jaw of the same.
 Fig. 24.—Genitalia of *S. anthropophagorum*.
 Fig. 25.—Genitalia of *C. rehsei*.
 Fig. 26.—Genitalia of *P. gurgusti*.
 Fig. 27.—Genitalia of *P. zeno*.
 Fig. 28.—Central and marginal teeth from the radula of *T. nigrans*.
 Fig. 29.—Genitalia of *P. chapmani*.